Industrial Bluetooth Solution for
wireless device networking

Bluetooth-Serial Adapter
OEM Bluetooth-Serial Module
Bluetooth Access Point
Bluetooth USB Adapter

Bluetooth® **Parani™**

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Product Overview

1 OEM Bluetooth-Serial Module

Designed to Simplify
Wireless Device Networking Into Your Box

The Parani-ESD Series, OEM Bluetooth-Serial Module is designed for integration into user devices by on-board installation. They are connected to the device via built-in UART interface and communicate with other Bluetooth devices.
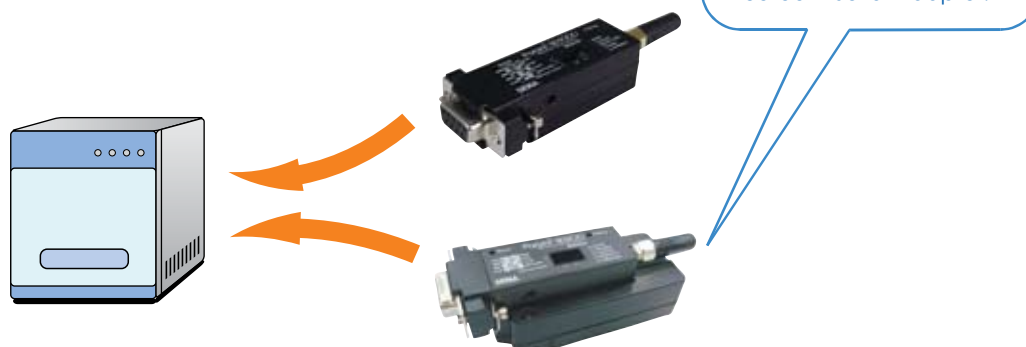
- Provides Bluetooth connectivity into your box
- Supports UART interface, up to 921.6kbps
- Bluetooth stack v1.2/2.0
  Improved AFH(Adaptive Frequency Hopping), Fast Connection
- Compact size - ESD100 : 27.5 x 30 x 14(mm)
             ESD110 : 27.5 x 27.7 x 14(mm)
             ESD200/210 : 18 x 20 x 11.7(mm)
             ESD1000 : 49 x 23 x 11(mm)
- Supports firmware upgrade via windows-based software(ParaniUpdater)
- Working distance(In an open field)
  Parani-ESD100 : Class 1, Nom. 100 meters
  Parani-ESD110 : Class 1, Nom. 100 meters, up to 1000m using patch antenna
  Parani-ESD200 : Class 2, Nom. 30meters
  Parani-ESD210 : Class 2, Nom. 30meters, up to 300m using patch antenna
  Parani-ESD1000 : Class 1, Nom. 100 meters, up to 1000m using patch antenna

Develop your new wireless network-enabled products using Sena OEM Bluetooth-Serial Module.

2 Bluetooth-Serial Adapter

The Parani-SD Series is an external Bluetooth serial adapter product line based on Bluetooth technology. The Parani-SD Series supports DIP switch and pairing button. Using DIP-switch of the Parani-SD Series, users can simply configure baud rate and hardware flow control settings of the Parani-SD Series without software. Pairing button enables two Parani-SD Series units to be connected automatically. The Parani-SD1000 supports 2 types of rechargeable battery pack options - Standard & Extended. The Parani-SD200 supports battery pack that can carry two AA batteries as an optional accessory. By using the Parani-SD Series, users can build up wireless network that replaces messy serial cabling.

- Provides transparent RS232 serial cable replacement.
- Supports Bluetooth 1.2 / 2.0 stack
   1.2 stack (Parani-SD100/200) : improved AFH(Adaptive Frequency Hopping), Fast connection.
   2.0 stack (Parani-SD1000) : EDR(Enhanced Data Rate)
- Supports firmware upgrade via windows-based software(ParaniUpdater)
- Working distance
  Parani-SD1000 : Class 1, Nom. 100 meters, up to 1000m using patch antenna
  Parani-SD100 : Class 1, Nom. 100 meters, up to 1000m using patch antenna
  Parani-SD200 : Class 2, Nom. 30 meters, up to 300m using patch antenna

Connect your existing devices to Bluetooth network instantly using Sena Bluetooth-Serial Adapter.

❸ Bluetooth Access Point

The Parani-MSP1000 is an Industrial Bluetooth Access Point product line designed to connect Bluetooth devices to the 10/100 Base-T Ethernet network with advanced features. These Bluetooth Access Points transmit data from each Bluetooth terminal to management station via TCP/IP.

Available in 7, 14, and 28 Bluetooth connections models, the Parani-MSP1000 Bluetooth Access Point product line incorporates Bluetooth 2.0 Protocol Stack with Enhanced Data Rate(EDR) support; and transmits data from each Bluetooth terminal to management station via TCP/IP.

- Connects Bluetooth devices to 10/100 base-T Ethernet.
- Dual Ethernet Interface support
- Supports up to 3Mbps throughput
- Ideal wireless solution for the replacement of the wired multi-port serial card.
- 7/14/28 Bluetooth Connections support
- Supports Bluetooth profiles for Serial Port, LAN Access, PAN, File Transfer and Dial up Networking.
- Easy-to-use COM-Port redirector support
- Flexible TCP/UDP host mode support : Multiple host connection/data transfer
- System logging & port logging
- Supports Python Script Engine for customization
- Supports firmware upgrade via web, hyper terminal program or etc.
- Supports surge protector
- Supports RFC 2217, Telnet COM Port Control Protocol.

Product	ESD1000	ESD100 / ESD110	ESD200 / ESD210	SD1000	SD100	SD200	MSP1000
Bluetooth Interface	Bluetooth v2.0 + EDR Class 1 Level - 18 dBm	Bluetooth v1.2 Class 1 Level - 18 dBm	Bluetooth v1.2 Class 2 Level - Max.4 dBm	Bluetooth v2.0 Class 1 Level - 18dBm	Bluetooth v1.2 Class 1 Level - 18 dBm	Bluetooth v1.2 Class 2 Level - Max. 4 dBm	Bluetooth v2.0 + EDR Class 1 Level - 18dBm Profiles - Serial Port, LAN Access, PAN, Dial up Networking, File Transfer
	Protocols - RFCOMM, L2CAP, SDP Profiles - General Access Profile, Serial Port Profile						
RF range	Nominal 100m, up 1000m using patch antenna	- ESD100 : Nominal 100m - ESD110 : Nominal 100m, up to 1000m using patch antenna	- ESD200 : Nominal 30m - ESD210 : Nominal 30m, up to 300m using patch antenna	Nominal 100m, up to 1000m using patch antenna	Nominal 100m, up to 1000m using patch antenna	Nominal 30m, up to 300m using patch antenna	Nominal 150m, up to 1000m using patch antenna
Network Interface	No	No	No	No	No	No	Dual 10/100 Base-T Ethernet with RJ45 connector
Serial Interface	UART			RS-232 Female DB9			RS-232 Male DB9 (Console)
Firmware upgrade	Yes(ParaniUpdater)						Yes (Web or HyperTerminal)
Applicable antenna	Stub Antenna Dipole Antenna Patch Antenna	- ESD100 : Built-in chip antenna - ESD110 : Stub Antenna Dipole Antenna Patch Antenna	- ESD200 : Built-in chip antenna - ESD210 : Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna

❹ Bluetooth USB Adapter

SENA's Bluetooth USB Adapter is a class 1 type Bluetooth product that supports 300 meters of wireless transmission distance by default. It is suitable for industrial or special applications, thanks to its longer communication distance than other regular Bluetooth USB adapters. It is compatible with other SENA Bluetooth devices perfectly.

Software Support

COM Port Redirector

Sena provides COM Port Redirector software for those users who want to use the existing application programs based on serial communication. This means that existing COM-based software can be preserved, without investing in additional software.

COM Port Redirector establishes a transparent connection between host and serial device by mapping the IP:Port of the Sena Bluetooth Access Point port to a local COM port on the host computer. For Windows systems, Sena offers Serial/IP COM Port Redirector software from Tactical Software.

◆ Serial / IP COM Port Redirector for Windows platform

When your solution includes software running on a Windows PC, and that software uses COM ports to communicate with devices, use COM port redirection solution.

The Serial/IP Redirector software runs at the kernel level to provide superior performance and low latency.

Features include: Up to 4,096 simultaneous connections; Selectable auto-reconnect option for "always-on" connections; Requires no other software for deployment, and Configuration Wizard automates and verifies settings.

Serial/IP Application Scenario

COM Port Redirector with Encryption

Sena now takes COM Port Redirection a step further with encryption features, offering a secure Ethernet connection between the COM port and a Sena Industrial Bluetooth Access Point. When working with the Serial/IP COM Port Redirector and OpenSSL Toolkit, the new SSL/TLS Security option offers a selection of five ciphers(including 3-DES and AES) and strengths up to 256 bits, sufficient to meet the tough security requirements encountered in the financial services industry.

Secure TCP/IP communication between the COM Port and a SENA Bluetooth Access Point

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TCP/IP

Host PC with COM Port Redirector

Bluetooth Access Point

UART

RS232

Serial Device

Meter

Payment Terminal

PLC

Sensor

Serial application

COM Port Redirector Software

Bluetooth Access Point
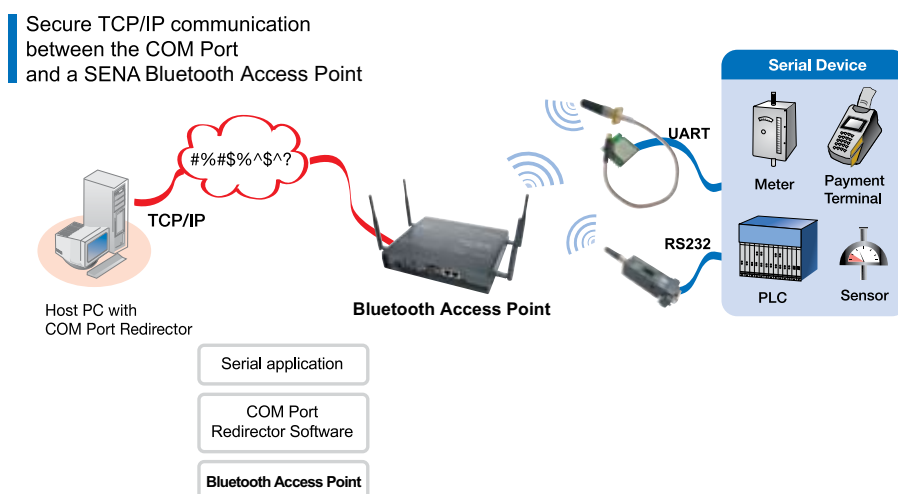
Utilities and Tools

▶ **ParaniWin**

ParaniWin is a Windows-based software to configure and to make a pair of the Parani-SD and Parani-ESD Series through on-screen menus instead of command line interface.
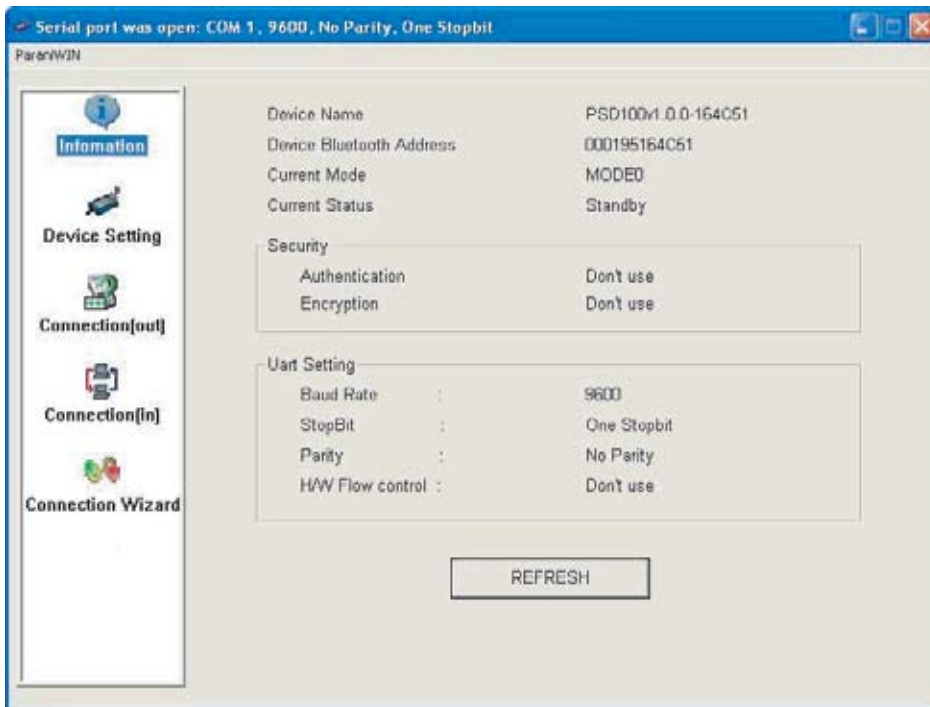
▶ **ParaniUpdater**

A Window-based firmware upgrade program that enables user to simply upgrade the firmware of all SENA Bluetooth products. Users can download new firmware images at SENA Web site.

Sena Device Servers

Wireless Device Networking

Sena offers wireless networking options either 1:1 communication solution for simple cable replacement or for 1:N communication solution for more advanced applications. Users may choose one flexibly from the Wireless LAN or Bluetooth based solutions according to their needs.

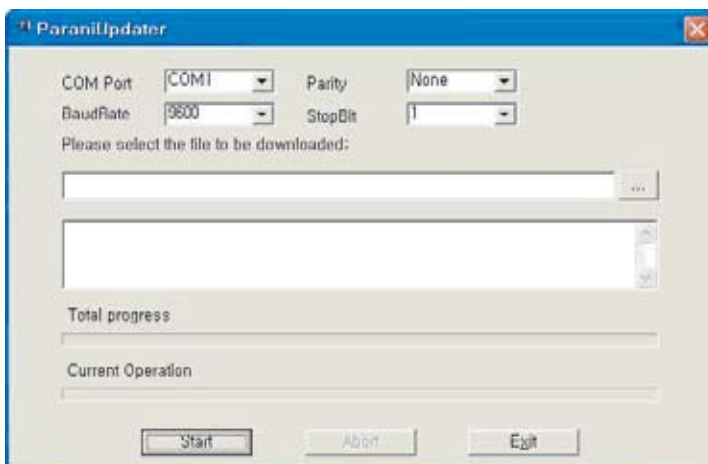Sena Device Server and Terminal Server's family supports wireless network interface either by PC Card interface or by built-in WiFi modules. The Parani family is a stand alone Bluetooth-compatible solution for wireless RS-232 serial cable replacement.

Sena's wireless device networking solution brings wireless networking capabilities to various equipments such as printers, scales, medical equipment, manufacturing machinery, barcode readers, card readers, RFID reader and other data collection devices.

Wireless
Management Station

Local/Remote
Management Station

Ethernet

STS Series

Wireless LAN

PS110W/210W

RS232

RS232/422/485

Serial Device

Bluetooth 1:N C

Parani-SD Series

RS232

Serial Device

Serial Devices
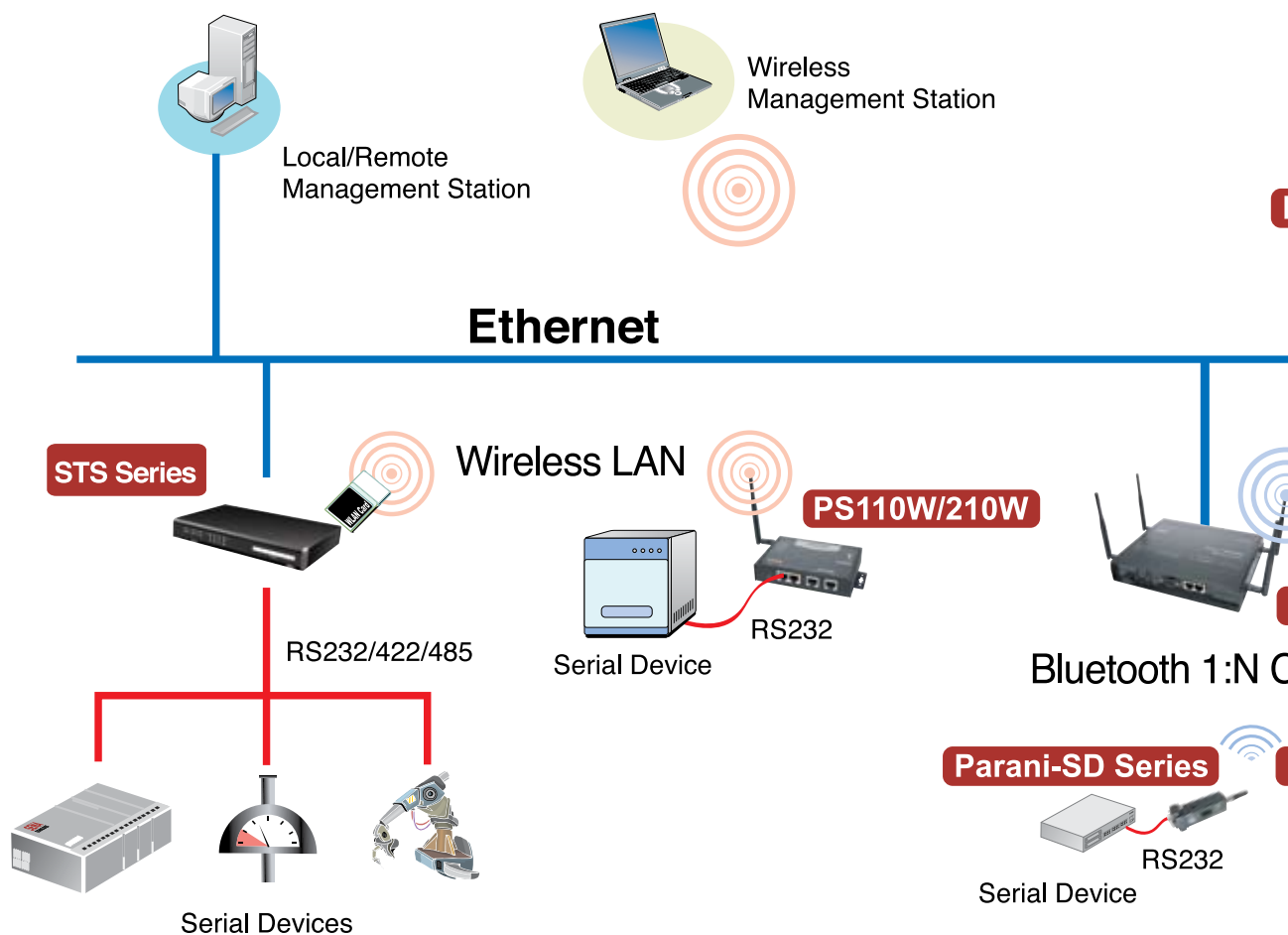
Parani-UD100   **Parani-UD100**

Bluetooth Communication

Parani-MSP1000

Communication

Parani-ESD Series

Serial Device

UART

Parani-SD Series

Serial Device   RS232
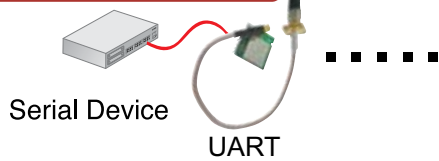
Bluetooth 1:1 Communication
(Cable replacement)

Parani-SD Series

Serial Device   RS232

Accessories

Sena offers accessories such as antennas, antenna extension cables and power supplies.

| Accessories	Description		Applicable Models
Antennas	Sena offers various antennas that extend wireless communication range. Stub Antenna Dipole Antenna	**SAT-G01R** : 1 dBi Stub Antenna - RP-SMA Plug Right-hand Thread **DAT-G01R** : 3 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread **DAT5-G01R** : 5 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread	Parani-MSP1000 Parani-ESD1000 Parani-SD1000 Parani-UD100
		SAT-G01 : Parani-SAT Stub Antenna-SMA Male-Left-hand thread **DAT-G01** : Parani-DAT Dipole Antenna-SMA Male-left-hand thread	Parani-SD100/200 Parani-ESD110/210
	Patch Antenna+Extension cable	**PAT-G01R** : 9dBi Patch Antenna with RP-SMA Plug Right hand Thread Default Cable. (SMA Jack Right hand Thread w/o Default Cable)	Parani-MSP1000 Parani-ESD1000 Parani-SD1000 Parani-UD100
		PAT-G01 : 9 dBi Patch Antenna-RP-SMA-R/A left-hand thread	Parani-SD100/200 Parani-ESD110/210
Antenna Extension Cables	The antenna extension cables can be used to extend the length between a device and antenna. RFC EEC-G01 SEC	**SEC-G01R** : 15cm Extension Cable (For SAT-G01R / DAT-G01R / DAT5-G01R) **RFC-G01R** : 1m Extension Cable (For PAT-G01R)	Parani-MSP1000 Parani-ESD1000 Parani-SD1000 Parani-UD100
		RFC-G01 : Parani-RFC 1m Antenna Extension Cable for Patch antenna **EEC-G01** : Parani-EEC 15cm Antenna Extension Cable for Parani-ESD110/210 only **SEC-G01** : Parani-SEC 15cm Antenna Extension Cable for Stub antenna or Dipole antenna of SD100/200	Parani-SD100/200 Parani-ESD110/210
Power Supplies	Sena offers various power supply options to meet the needs at different power circumstances. EPA-G01 OPA-G01 UPA-G01 BPC-G01 BPC-G02 BPC-G03	**EPA-G01** : Parani-EPA External Power Adaptor-220V **OPA-G01** : Parani-OPA External Power Adaptor (International, 4 types: EU, America, UK, Australia) **UPA-G01** : Parani-UPA USB Power Cable **BPC-G01** : Parani-BPC Battery Pack for SD200 only **BPC-G02** : Parani-BPC Standard Battery Pack for SD1000 **BPC-G03** : Parani-BPC Extended Battery Pack for SD1000	Parani-SD100/200 Parani-SD1000
Others	FM9GD-G01 SLR-G01	**FM9GD-G01** : DB9 Female to Male Gender Changer **SLR-G01** : SMA-Male left handed to right handed adapter	Parani-SD100/200 Parani-ESD110/210 Parani-SD1000

Features

- Bluetooth Specification v2.0 + EDR
- Provides transparent RS232 serial cable replacement
- Basic Transmit Power : Max. +18dBm,
  EDR Transmit Power : Max. +6dBm
- Receiving Sensitivity : -88dBm(0.1%BER)
- Supports Bluetooth profiles SPP(Serial Port Profile)
- Interoperability with PDA, laptops etc.
- Supports firmware upgrade via windows-based software (ParaniUpdater)
- Working distance (In an open field) : Nom. 100 meters, up to 1000m using patch antenna
- Enhanced portability : standard & extended battery pack options
- Easy to use Windows configuration tool available.
- No external drivers required.

Panel Layout

Factory Reset Button
DIP Switch Set
Pairing Button
Stub Antenna
LED Set

On this side:
DC Connector

On the opposite side:
ON/OFF Switch

The Parani-SD1000 is a Class1 type of Bluetooth Serial Adapter that supports 100 meters of wireless transmit distance by default. The Parani-SD1000 has an extension option so that users can extend the transmit distance up to 1000 meters using optional antennas. It supports Bluetooth v2.0+EDR specification. Parani-SD1000 has two battery-pack options, standard and extended battery pack. By these options, Parani-SD1000's portability is more enhanced.

Typical application areas of the Parani-SD1000 include :
- RS232 Cable Replacement
- Truck/Bus Monitoring System
- Car Diagnostics
- Wireless POS System
- Wireless Machine(Healthcare/Industrial) Monitoring
- Wireless Factory Monitoring
- PLC Programming
- Wireless Printing
- Wireless Logistics

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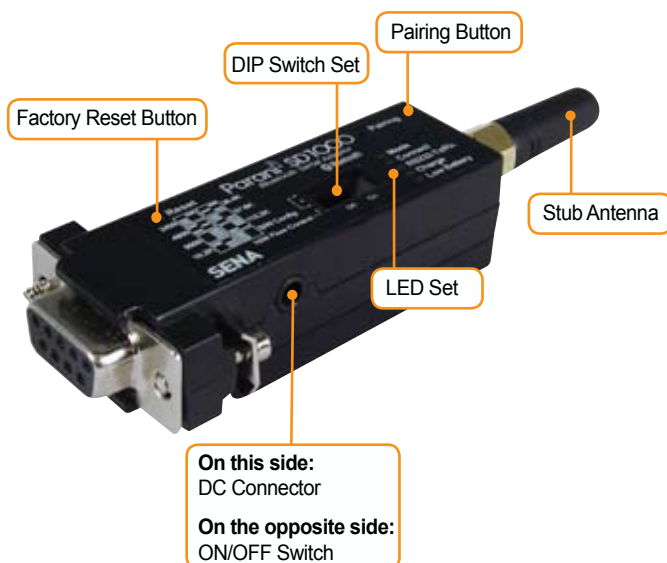
Specifications

Serial Interface
- Serial speed up to 921.6kbps
- CTS/RTS flow control, DTR/DSR for loop-back & full transfer

Bluetooth Interface
- Bluetooth v2.0 + EDR
- Class 1
- Profiles - SPP
- Working distance (in open field)

SAT-G01R	-	SAT-G01R	100 meters
SAT-G01R	-	DAT-G01R	150 meters
DAT-G01R	-	DAT-G01R	200 meters
DAT-G01R	-	DAT5-G01R	300 meters
DAT-G01R	-	PAT-G01R	500 meters
DAT5-G01R	-	DAT5-G01R	400 meters
DAT5-G01R	-	PAT-G01R	600 meters
PAT-G01R	-	PAT-G01R	1,000 meters

[Antennas]
SAT-G01R : +1dBi Stub Antenna
DAT-G01R : +3dBi Dipole Antenna
DAT5-G01R : +5dBi Dipole Antenna
PAT-G01R : +9dBi Patch Antenna

Max. Tx power : +18dBm

Receive Sensitivity : -88dBm

Configuration
- ParaniWin, ParaniUpdater
- Modem AT command set

Diagnostic LED
- BT Status (mode)
- Connect
- RS232-RX/TX
- Charging/Done (Battery Charging/ Battery Charging completed)
- Low Battery

Power
- Power input : 5~12VDC
- Power Consumption : Minimum 2mA, Maximum 80mA

Battery Pack
- Capacity
  · 240 mAh(standard)
  · 900 mAh(extended)
- Charging Power : minium 5V/200mA
- Charging Time
  · Approximately 2 hours (standard)
  · Approximately 5 hours (extended)
- Battery life (Test based on 9600 bps data loopback. Actual battery life varies by configuration, operating conditions and other factors)
  · Approximately 4.5 hours (standard)
  · Approximately 16.5 hours (extended)

Environmental
- Operating temperature: -20˚C to 70˚C
- Storage temperature: -40˚C to 85˚C
- Humidity: 90% Non-condensing

Physical properties
- Dimension (L x W x H)
  · 76 x 31 x 16 (mm) (No battery pack)
  · 76 x 31 x 19.5 (mm) (with standard battery pack)
  · 76 x 31 x 31.4 (mm) (with extended battery pack)
- Weight
  · 24g (No battery pack)
  · 30g (with standard battery pack)
  · 42g (with extended battery pack)

Certification
- CE, FCC, TELEC, MIC

Warranty
- 3-year limited warranty

Ordering Information

Single Pack SD1000-00 Includes
- SD1000 : SD1000 Bluetooth-serial adapter
- DPA-G01 : Parani-DPA DC power cable for SD series
- UPA-G01 : Parani-UPA USB Power Cable
- SAT-G01R : 1 dBi Stub Antenna - RP-SMA Plug Right-hand Thread
- FM9GD-G01 : DB9 Female to Male Gender Changer
- CD-ROM

Single Pack SD1000-01 Includes
- Single pack SD1000-00
- OPA-G01 : Parani-OPA External Power Adaptor-International - 4 types: EU, America, UK, Australia

Bulk Pack SD1000-B10 Includes
- SD1000(×10EA) : SD1000 Bluetooth-serial adapter
- SAT-G01R(×10EA) : 1 dBi Stub Antenna - RP-SMA Plug Right-hand Thread
- DPA-G01(×10EA) : Parani-DPA DC power cable for SD series

Optional Accessories
- SAT-G01R : 1 dBi Stub Antenna - RP-SMA Plug Right-hand Thread
- DPA-G01 : Parani-DPA DC power cable for SD series
- UPA-G01 : Parani-UPA USB Power Cable
- OPA-G01 : Parani-OPA External Power Adaptor-International - 4 types: EU, America, UK, Australia
- BPC-G02 : Parani-BPC standard Battery Pack for SD1000
- BPC-G03 : Parani-BPC extended Battery Pack for SD1000
- DAT-G01R : 3 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread
- DAT5-G01R : 5 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread
- PAT-G01R : 9dBi Patch Antenna with RP-SMA Plug Right hand Thread Default Cable.
  (SMA Jack Right hand Thread w/o Default Cable)
- SEC-G01R : 15cm Extension Cable(For SAT-G01R / DAT-G01R / DAT5-G01R)
- RFC-G01R : 1m Extension Cable(For PAT-G01R)
- FM9GD -G01 : DB9 Female to Male Gender Changer

For more information, please visit us at http://www.sena.com

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Parani™ SD100/200

Features

· Provides transparent RS232 serial cable replacement.
· Supports Bluetooth stack 1.2 - improved AFH(Adaptive Frequency Hopping), Fast connection.
· Transmit Power - SD100 : Max. +18dBm
   SD200 : Max. +4dBm
· Receiving Sensitivity - SD100 : -88dBm(0.1%BER)
   SD200 : -80dBm(0.1%BER)
· Antenna gain - Stub : +2dBi, Dipole : +3dBi, Patch : +9dBi
· Supports Bluetooth Serial Port Profile.
· Interoperability with PDA, laptops etc.
· Supports firmware upgrade via windows-based software (ParaniUpdater)
· Working distance(In an open field)
  - Parani-SD100 : Class 1, Nom. 100 meters,
     up to 1000m using patch antenna
  - Parani-SD200 : Class 2, Nom. 30 meters,
     up to 300m using patch antenna
· Software-free configuration support using DIP-Switch and pairing button
· Parani-SD200 : Supports battery pack(Two AA batteries)
· No external drivers required.

Parani-SD Series is a Bluetooth serial adapter product line based on Bluetooth technology. Parani-SD Series enables RS232-based serial devices to communicate wirelessly throughout the range of 30m~300m(Parani-SD200-Class 2) or 100m~1000m(Parani-SD100-Class 1).

Users may configure the Parani-SD Series by using combination of DIP-switch and Pairing button, easy-to-use Windows-based utility software or by using standard AT command set.

Using DIP-switch of the Parani-SD Series, user can simply configure baud rate and hardware flow control settings of the Parani-SD Series. Pairing-button enables two Parani-SD Series units to be connected automatically.
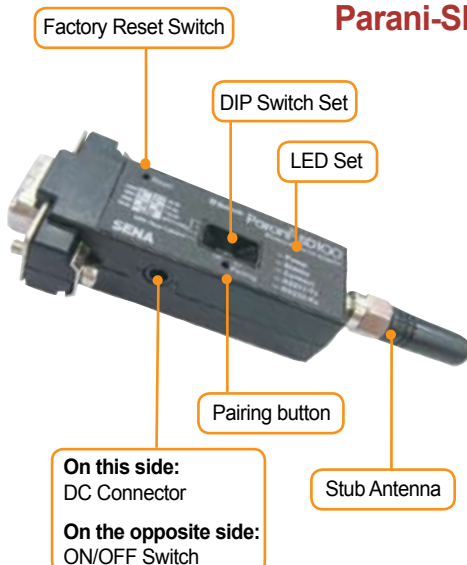
Flexible power supply options allow users to choose which options suits them best, i.e. Power by DC power cable, Power by external DC adapter, Power by USB power cable, Power by pin 9 of DB9 connector. The Parani-SD supports battery pack that can carry two AA batteries. Users can use both general type batteries or rechargeable ones. Battery pack allows users to recharge the batteries.

Typical application areas of the Parani-SD Series include :
- RS232 cable replacement   - Wireless Factory monitoring
- Truck/Bus monitoring system   - PLC programming
- Car Diagnostics   - Wireless Printing
- Wireless POS system   - Wireless logistics
- Wireless machine(healthcare/industrial) monitoring

Panel Layout

Parani-SD100

Factory Reset Switch
DIP Switch Set
LED Set
Pairing button
Stub Antenna

On this side:
DC Connector

On the opposite side:
ON/OFF Switch

Parani-SD200

Factory Reset Switch
Pairing Button
Stub Antenna
LED Set
DIP Switch Set
Battery Pack

On this side:
DC Connector

On the opposite side:
ON/OFF Switch
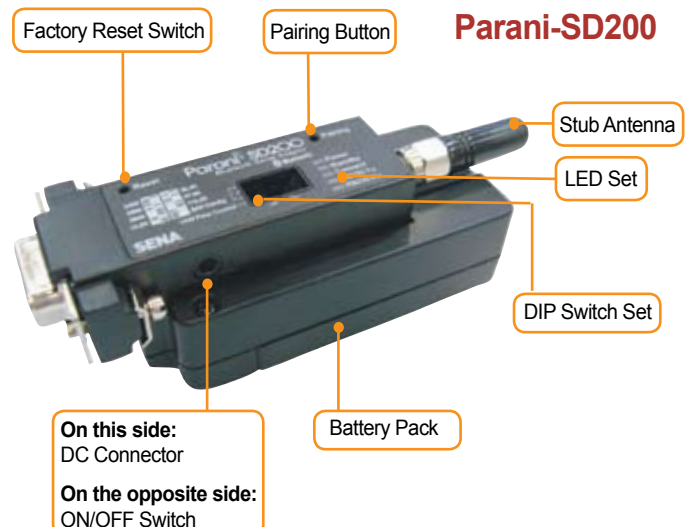
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Specifications

Serial Interface
- RS232, Female DB9, 1200bps ~ 230Kbps
- CTS/RTS flow control : Default
- DTR/DSR for loop-back & full transfer

Bluetooth Interface
- Parani-SD100
  · Bluetooth v1.2
  · Class 1
  · Level - 18 dBm
  · Protocols - RFCOMM, L2CAP, SDP
  · Profiles - General Access Profile, Serial Port Profile
  · Working distance
    Default Antenna - Default Antenna 100 meters
    Default Antenna - Dipole Antenna 150 meters
    Dipole Antenna - Dipole Antenna 200 meters
    Patch Antenna   - Dipole Antenna 400 meters
    Patch Antenna   - Patch Antenna 1,000 meters

- Parani-SD200
  · Bluetooth v1.2
  · Class 2
  · Level - Max. 4 dBm
  · Protocols - RFCOMM, L2CAP, SDP
  · Profiles - General Access Profile, Serial Port Profile
  · Working distance
    Default Antenna - Default Antenna 30 meters
    Default Antenna - Dipole Antenna 50 meters
    Dipole Antenna - Dipole Antenna 80 meters
    Patch Antenna   - Dipole Antenna 150 meters
    Patch Antenna   - Patch Antenna 300 meters

Configuration
- ParaniWin, Modem AT command set

Firmware Update
- ParaniUpdater

Diagnostic LED
- Power
- Standby
- Connect
- RS232-Tx
- RS232-Rx

Power
- 5~12VDC
- Nominal current consumption
  · SD100 : 100mA @ 5.0VDC approximately
  · SD200 : 70mA @ 5.0VDC approximately
- Common Power supply options
  · Power via a standard AC-plug DC-adapter
  · Power via USB power cable
  · Power via DC power cable
  · Power via pin 9 of DB9 connector
  · Battery Pack for SD200 only

Battery Usage Time
- When using battery pack for SD200 :
  Typical 1.5V-AA alkaline batteries(2500mAh)
- Avg. 11hr@9600bps
- Note : Depending on the batteries and its usage environment greatly determines how long the Parani product will last for their application, i.e.battery storage, battery capacity, battery brand and so on.

Environmental
- Operating temperature : -10°C to 55°C
- Storage temperature : -20°C to 70°C
- Humidity : 90% Non-condensing

Physical properties
- Dimension(L x W x H)
  · SD100 - 70 x 30.8 x 16.2(mm)
  · SD200 - 75.3 x 30.8 x 16.2(mm)
- Weight : SD100 - 22g / SD200 - 20g

MTBF
- Parani-SD100 : 121.74 Years
- Parani-SD200 : 394.4 Years

Certification
- FCC, CE, TELEC

Warranty
- 3-year limited warranty

Ordering Information

SD100   Parani-SD100 Bluetooth-Serial Adapter-Class1-DIP
SD200   Parani-SD200 Bluetooth-Serial Adapter-Class2-DIP

Single Pack SD100-00, SD200-00 Includes
- Bluetooth-serial adapter : SD100 (for SD100-00), SD200 (for SD200-00)
- DPA : Parani-DPA DC power cable for SD series
- UPA : Parani-UPA USB Power Cable
- SAT : Parani-SAT Stub Antenna-SMA Male-Left Handed
- FM9GD : DB9 Female to Male Gender Changer
- CD-ROM

Single Pack SD100-01, SD200-01 Includes
- Single pack SD100-00 (for SD100-01), SD200-00 (for SD200-01)
- OPA : Parani-OPA External Power Adaptor-International - 4 types: EU, America, UK, Australia

10-Unit Bulk Pack SD100-B10, SD200-B10 Includes
- Bluetooth-serial adapter (×10EA) : SD100 (for SD100-B10), SD200 (for SD200-B10)
- SAT (×10EA) : Parani-SAT Stub Antenna-SMA Male-Left Handed
- DPA (×10EA) : Parani-DPA DC power cable for SD series

Optional Accessories
- UPA : Parani-UPA USB Power Cable
- OPA : Parani-OPA External Power Adaptor-International - 4 types: EU, America, UK, Australia
- BPC : Parani-BPC Battery Pack for SD200 only.
- DAT : Parani-DAT Dipole Antenna-SMA Male-Left Handed
- PAT : Parani-PAT Patch Antenna-SMA R/A Female-Right Handed
- RFC : Parani-RFC 1m Antenna Extension Cable for Patch antenna
- SEC : Parani-SEC 15cm Antenna Extension Cable for Stub antenna or Dipole antenna of SD100/200
- FM9GD : DB9 Female to Male Gender Changer
- SLR : SMA-Male left handed to right handed adapter
- CD-ROM

For more information,
please visit us at http://www.sena.com

U.S. / Canada / South America
Tel : +1 (408) 573-7425   Fax : +1 (408) 907-3738
Toll Free (US/Canada): 1-8668-US-SENA (1-866-887-7362)

EU / Africa
Tel : +33 (0) 1 53 53 16 29   Fax : +33 (0) 1 70 24 70 90
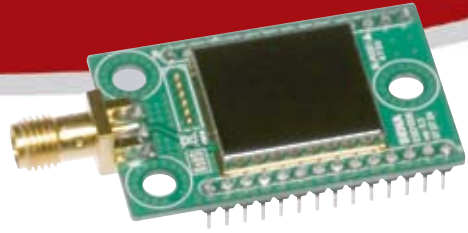
Asia / Pacific
Tel : +82-2-571-8283   Fax : +82-2-573-7710

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Parani™ ESD1000

Parani-ESD1000 is Class1 type Embedded Bluetooth Module for users to make their devices Bluetooth-enable. By default, it supports 100 meters of wireless transmit distance. The Parani-ESD1000 has an extension option so that users can extend the transmit distance up to 1000 meters using optional antennas. It supports Bluetooth v2.0+EDR specification, and external interface UART.
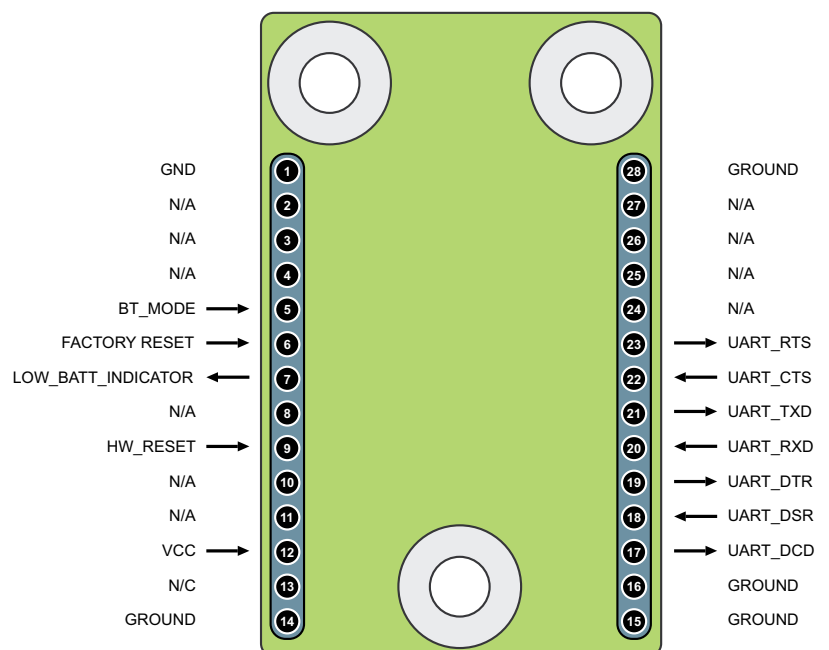
Users may configure the Parani-ESD1000 by using easy-to-use Windows-based utility software or by using standard AT command set.

Typical application areas of the Parani-ESD1000 include :
- RS232 cable replacement
- Truck/Bus monitoring system
- Car Diagnostics
- Wireless POS system
- Wireless Machine(Healthcare/Industrial) monitoring
- Wireless Factory monitoring
- PLC programming
- Wireless Printing
- Wireless Logistics

Features

· Bluetooth Specification v2.0 + EDR
· Useful for Bluetooth-enabling users' devices
· Basic Transmit Power : Max. +18dBm, EDR Transmit Power : Max. +6dBm
· Receiving Sensitivity : -88dBm(0.1%BER)
· Supports Bluetooth profiles SPP(Serial Port Profile)
· External interface for UART
· Interoperability with PDA, laptops etc.
· Supports firmware upgrade via windows-based software (ParaniUpdater)
· Working distance(In an open field) : Nom. 100 meters, up to 1000m using patch antenna
· Easy to use Windows configuration tool available.
· No external drivers required.

Pin Assignment Information

Pin NO.	Pin Name	Direction	Description	Signal Level
1	GND	-	GROUND	GROUND
2	N/A			
3	N/A			
4	N/A			
5	BT_MODE	IN	Pairing signal	TTL
6	FACTORY RESET	IN	Factory reset signal(Active 'L')	TTL
7	LOW_BATT_INDICATOR	OUT	Low battery status(Active 'L')	TTL
8	N/A			
9	HW_RESET	IN	Hardware reset signal(Active 'L')	TTL
10	N/A			
11	N/A			
12	VCC	IN	Power(3.3V)	POWER
13	N/C			
14	GROUND	-	GROUND	GROUND
15	GROUND	-	GROUND	GROUND
16	GROUND	-	GROUND	GROUND
17	UART_DCD	OUT	UART DCD(data carrier detect)	TTL
18	UART_DSR	IN	UART DSR(data set ready)	TTL
19	UART_DTR	OUT	UART DTR(data terminal ready)	TTL
20	UART_RXD	IN	UART RXD(receive data)	TTL
21	UART_TXD	OUT	UART TXD(transmit data)	TTL
22	UART_CTS	IN	UART CTS(clear to send)	TTL
23	UART_RTS	OUT	UART RTS(ready to send)	TTL
24	N/A			
25	N/A			
26	N/A			
27	N/A			
28	GROUND	-	GROUND	GROUND

Pin diagram:

Left side	Pin		Pin	Right side
GND	1		28	GROUND
N/A	2		27	N/A
N/A	3		26	N/A
N/A	4		25	N/A
BT_MODE →	5		24	N/A
FACTORY RESET →	6		23	→ UART_RTS
LOW_BATT_INDICATOR ←	7		22	← UART_CTS
N/A	8		21	→ UART_TXD
HW_RESET →	9		20	← UART_RXD
N/A	10		19	→ UART_DTR
N/A	11		18	← UART_DSR
VCC →	12		17	→ UART_DCD
N/C	13		16	GROUND
GROUND	14		15	GROUND

OEM Bluetooth-Serial Module,

Parani™ ESD1000

Specifications

Serial Interface
- UART
- 2mm Header 14 x 2
- Serial UART speed up to 921.6kbps
- CTS/RTS flow control, DTR/DSR for loop-back & full transfer

Bluetooth Interface
- Bluetooth v2.0 + EDR
- Class 1
- Profiles : SPP
- Working distance(in open field)

SAT-G01R	-	SAT-G01R	100 meters
SAT-G01R	-	DAT-G01R	150 meters
DAT-G01R	-	DAT-G01R	200 meters
DAT-G01R	-	DAT5-G01R	300 meters
DAT-G01R	-	PAT-G01R	500 meters
DAT5-G01R	-	DAT5-G01R	400 meters
DAT5-G01R	-	PAT-G01R	600 meters
PAT-G01R	-	PAT-G01R	1,000 meters

[Antennas]
SAT-G01R : +1dBi Stub Antenna
DAT-G01R : +3dBi Dipole Antenna
DAT5-G01R : +5dBi Dipole Antenna
PAT-G01R : +9dBi Patch Antenna

Max. Tx power: +18dBm

Receive Sensitivity: -88dBm

Antenna gain
- Stub : +1dBi, Dipole : +3dBi, Dipole : +5dBi, Patch : +9dBi

Configuration
- ParaniWin, ParaniWizard, ParaniUpdater
- Modem AT command set

Diagnostic LED
- TXD, RXD, RTS, CTS, DTR, DSR, DCD on Jig board

Power
- 3.3VDC
- Minimum : 10mA, Maximum : 60mA

Environmental
- Operating temperature : -30˚C to 80˚C
- Storage temperature : -40˚C to 85˚C
- Humidity : 90% Non-condensing

Physical properties
- Dimension(L x W x H) :
  49 x 23 x 11(mm)
  1.93 x 0.9 x 0.43(in.)
- Weight : 6g

MTBF: 400.89 Years

Regulatory Approvals
- FCC Part 15 Subpart C Section 15.247
- EN 60950-1 : 2001
- ETSI EN 300 328
- ETSI EN 301 489-1
- ETSI EN 301 489-17
- MIC(Type Registration)
- TELEC(Type Certification)
- SIG

Warranty: 1-year limited warranty

Parani-ESD1000 Starter Kit

The Parani-ESD1000 Starter Kit includes the evaluation board with the sample circuitry for Parani-ESD1000 interface, power, RS232 interface, H/W Reset, LEDs for users' device development.
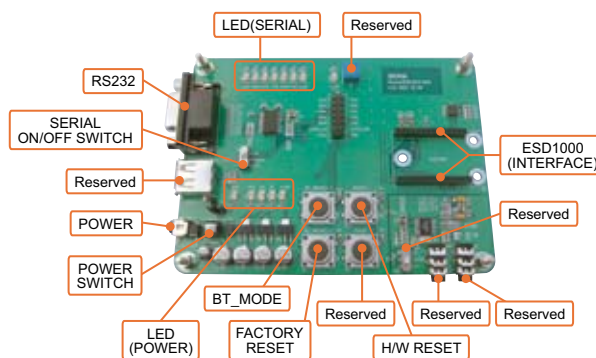
Ordering Information

ESD1000 Parani-ESD1000 OEM Bluetooth-Serial Module-Class1 with antenna extension option
ESD1000-00
Optional Accessories
- SAT-G01R : 1 dBi Stub Antenna - RP-SMA Plug Right-hand Thread
- DAT-G01R : 3 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread
- DAT5-G01R : 5 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread
- PAT-G01R : 9dBi Patch Antenna with RP-SMA Plug Right hand Thread Default Cable.
  (SMA Jack Right hand Thread w/o Default Cable)
- SEC-G01R : 15cm Extension Cable(For SAT-G01R / DAT-G01R / DAT5-G01R)
- RFC-G01R : 1m Extension Cable(For PAT-G01R)

ESD1000SK Parani-ESD1000 Starter Kit
Includes
- Parani-ESD1000 Module
- Jig board
- DC Power Adapter
- Serial data cable
- Quick Start Guide
- SAT-G01R : 1 dBi Stub Antenna - RP-SMA Plug Right-hand Thread
- CD-ROM

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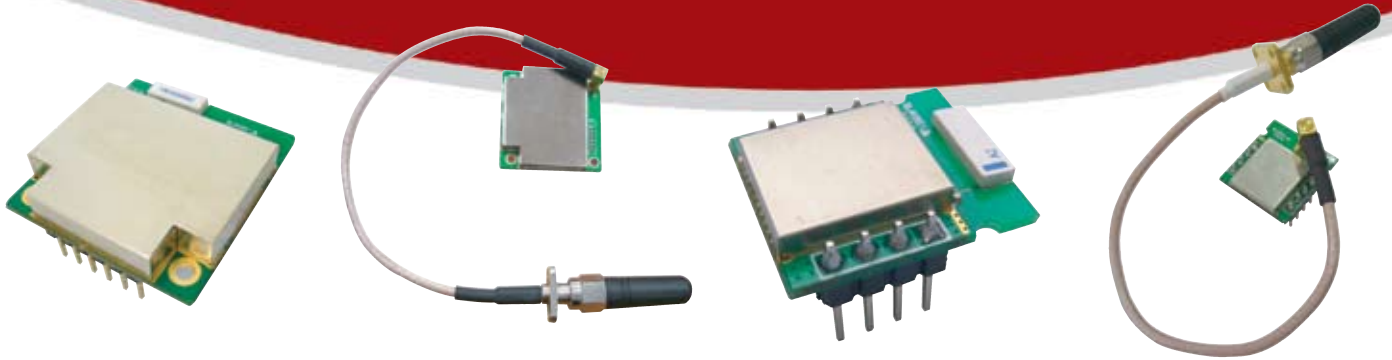**Asia / Pacific**
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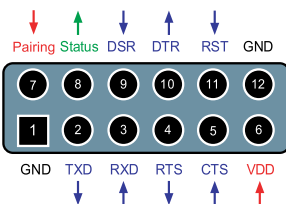
Parani™ ESD100/110/200/210

Features

· Output Interface UART, Compliant Bluetooth stack v1.2-improved
  AFH(Adaptive Frequency Hopping), Fast connection
· Transmit Power - ESD100/110 : Max. +18dBm
                   ESD200/210 : Max. +4dBm
· Receiving Sensitivity - ESD100/110 : -88dBm(0.1%BER)
                          ESD200/210 : -80dBm(0.1%BER)
· Antenna gain - Chip : 0dBi, Stub : +2dBi, Dipole : +3dBi, Patch : +9dBi
· Compact size - ESD100 : 27.5 x 30 x 14(mm)
                 ESD110 : 27.5 x 27.7 x 14(mm)
                 ESD200/210 :18 x 20 x 11.7(mm)
· Provides transparent RS232 serial cable replacement.
· Supports Bluetooth Serial Port Profile.
· Interoperability with PDA, laptops etc.
· Built-in chip antenna included
· Supports firmware upgrade via windows-based software
  (ParaniUpdater)
· Working distance(In an open field)
  - Parani-ESD100 : Class 1, Nom. 100 meters
  - Parani-ESD110 : Class 1, Nom. 100 meters,
                    up to 1000m using patch antenna
  - Parani-ESD200 : Class 2, Nom. 30meters
  - Parani-ESD210 : Class 2, Nom. 30meters,
                    up to 300m using patch antenna
· Easy to use Windows configuration tool available.
· No external drivers required.

Parani-ESD Series is OEM Bluetooth-Serial Module type product line based on Bluetooth technology. Parani-ESD Series is designed for integration into user devices by on-board installation. They are connected to the device via built-in UART interface and communicate with other Bluetooth device.
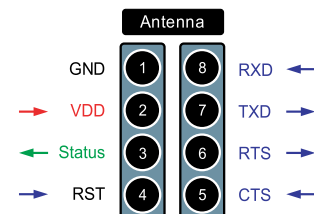
Parani-ESD Series enables RS232-based serial devices to communicate wirelessly throughout the range of 30m~300m(Parani-ESD210-Class 2) or 100m~1000m(Parani-ESD110-Class 1).
Parani-ESD100/200 has a built-in on-board antenna and Parani-ESD110/210 has an antenna connector for connecting external antenna. Users can extend Bluetooth communication range by connecting the external antenna to antenna connector.

Users may configure the Parani-ESD Series by using easy-to-use Windows-based utility software or by using standard AT command set.

Typical application areas of the Parani-ESD Series include :
- RS232 cable replacement   - Wireless Factory monitoring
- Truck/Bus monitoring system   - PLC programming
- Car Diagnostics   - Wireless Printing
- Wireless POS system   - Wireless logistics
- Wireless machine(healthcare/industrial) monitoring

Pin Assignment Information

Parani-ESD100/110

Pin no.	Pin name	Direction	Description	Signal Level
1	GND		Power Ground	Ground
2	TXD	Output	UART data out	TTL
3	RXD	Input	UART data input	TTL
4	RTS	Output	UART Ready to Send	TTL
5	CTS	Input	UART Clear to Send	TTL
6	VDD	Input	DC input (3.0 ~ 3.3V)	Power
7	Pairing	Input	Pairing input (Active Low)	TTL
8	Status	Output	Bluetooth Connect Detect (Active Low)	TTL
9	DSR	Input	Data Set Ready	TTL
10	DTR	Output	Data Terminal Ready	TTL
11	RST	Input	Reset (Active Low)	TTL
12	GND		Power Ground	Ground

Parani-ESD200/210

Pin no.	Pin name	Direction	Description	Signal Level
1	GND		Power Ground	Ground
2	VDD	Input	DC input (3.0 ~ 3.3V)	Power
3	Status	Output	Bluetooth Connect Detect (Active Low)	TTL
4	RST	Input	Reset (Active Low)	TTL
5	CTS	Input	UART Clear to Send	TTL
6	RTS	Output	UART Ready to Send	TTL
7	TXD	Output	UART data out	TTL
8	RXD	Input	UART data input	TTL

Parani™ ESD100/110/200/210

Specifications

Serial Interface
- Parani-ESD100/110
  · UART Interface, 2.54mm Header 2x6, 1200bps to 230 Kbps
  · CTS/RTS flow control : Default
  · DTR/DSR for loop-back & full transfer
- Parani-ESD200/210
  · UART Interface, 2.54mm Header 1x4x2, 1200bps to 230 Kbps
  · CTS/RTS flow control : Default

Bluetooth Interface
- Parani-ESD100/110
  · Bluetooth v1.2
  · Class 1
  · Level - 18 dBm
  · Protocols - RFCOMM, L2CAP, SDP
  · Profiles - General Access Profile, Serial Port Profile
  · Working distance
    ESD100 :
    Nominal 100 meters

    ESD110 :
    Default Antenna - Default Antenna 100 meters
    Default Antenna - Dipole Antenna 150 meters
    Dipole Antenna - Dipole Antenna 200 meters
    Patch Antenna - Dipole Antenna 400 meters
    Patch Antenna - Patch Antenna 1,000 meters

- Parani-ESD200/210
  · Bluetooth v1.2
  · Class 2
  · Level - Max. 4 dBm
  · Protocols - RFCOMM, L2CAP, SDP
  · Profiles - General Access Profile, Serial Port Profile
  · Working distance
    ESD200 :
    Nominal 30 meters

Bluetooth Interface
ESD210 :
Default Antenna - Default Antenna 30 meters
Default Antenna - Dipole Antenna 50 meters
Dipole Antenna - Dipole Antenna 80 meters
Patch Antenna - Dipole Antenna 150 meters
Patch Antenna - Patch Antenna 300 meters

Configuration: ParaniWin, ParaniWizard, Modem AT command set

Firmware Update: ParaniUpdater

Power
- 3.3VDC
- Nominal current consumption
  · ESD100/110 : 70mA @ 3.3VDC approximately
  · ESD200/210 : 40mA @ 3.3VDC approximately

Environmental
- Operating temperature : -10˚C to 55˚C
- Storage temperature : -20˚C to 70˚C
- Humidity : 90% Non-condensing

Physical properties
- Parani-ESD100 :   - Parani-ESD110 :   - Parani-ESD200/210 :
  27.5 x 30 x 14(mm),   27.5 x 27.7 x 14(mm),   18 x 20 x 11.7(mm)
  1.08 x 1.18 x 0.55(in.)   1.08 x 1.09 x 0.55(in.)   0.7 x 0.78 x 0.47(in.)
- Weight : ESD100 - 7g / ESD110 - 17g / ESD200 - 4g / ESD210 - 14g

MTBF
- Parani-ESD100 : 136.73 Years / Parani-ESD110 : 137.1 Years
- Parani-ESD200 : 556.53 Years / Parani-ESD210 : 562.74 Years

Approvals: FCC, CE

Warranty: 1-year limited warranty

Parani-ESD Starter Kit

Parani-ESD Starter Kit includes the evaluation board with the sample circuitry for Parani-ESD100/110/200/210 interface, power, RS232 Interface, Reset, LEDs, Pairing, H/W flow control for user device development.
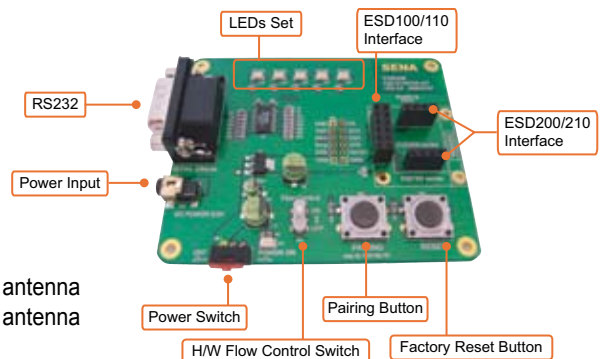
Ordering Information

ESD100 Parani-ESD100 OEM Bluetooth-Serial Module-Class1 with Built-in chip antenna
ESD200 Parani-ESD200 OEM Bluetooth-Serial Module-Class2 with Built-in chip antenna
ESD100-01, ESD200-01
Includes : Embedded On-board Antenna

ESD110 Parani-ESD110 OEM Bluetooth-Serial Module-Class1 with antenna extension option
ESD210 Parani-ESD210 OEM Bluetooth-Serial Module-Class2 with antenna extension option
ESD110-00, ESD110-01, ESD210-00, ESD210-01
ESD110-00 and ESD210-00 : Module only - antenna and cable NOT included
ESD110-01 and ESD210-01 Includes :
- SAT : Parani-SAT Stub Antenna-SMA Male-Left Handed
- EEC : Parani-EEC 15cm Antenna Extension Cable
Optional Accessories :
- DAT : Parani-DAT Dipole Antenna-SMA Male-Left Handed
- PAT : Parani-PAT Patch Antenna-SMA R/A Female-Right Handed
- SLR : SMA-Male left handed to right handed adapter
- RFC : Parani-RFC 1m Antenna Extension Cable for Patch antenna

Parani-ESD100SK Starter Kit for Parani-ESD100
Parani-ESD110SK Starter Kit for Parani-ESD110
Parani-ESD200SK Starter Kit for Parani-ESD200
Parani-ESD210SK Starter Kit for Parani-ESD210
Includes :
- Any one of the following modules : ESD100, ESD110, ESD200, ESD210
- Jig board
- DC Power Adapter
- Serial data cable
- CD-ROM

For more information,
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Bluetooth Access Point,

Parani ™ MSP1000

Features

- · Connects Bluetooth devices to 10/100 base-T Ethernet
- · Supports Bluetooth 2.0+EDR, up to 3Mbps throughput
- · 7/14/28 Bluetooth Connections support
- · Supports Bluetooth profiles for Serial Port, LAN Access, PAN, File Transfer and Dial up Networking.
- · Dual Ethernet support for fail-over operation
- · Ideal wireless solution for the replacement of the wired multi-port serial card.
- · Easy-to-use COM-Port redirector support, RFC 2217, Telnet COM Port Control Protocol
- · Flexible TCP/UDP host mode support : Multiple host connection/data transfer
- · Supports system logging & port logging
- · Supports Python Script Engine for user customization
- · Supports firmware upgrade via web, hyper terminal program or etc.

The Parani-MSP1000 is a Bluetooth Access Point to enable Bluetooth devices to be connected to 10/100Mbps Ethernet network. Parani-MSP1000 supports 7, 14, and 28 Bluetooth connections according to the model, and it supports up to 3Mbps throughput through Bluetooth 2.0+EDR specification. Parani-MSP1000 is a class 1 Bluetooth device that supports 150m using basic dipole antenna and up to 1 km using patch antenna.
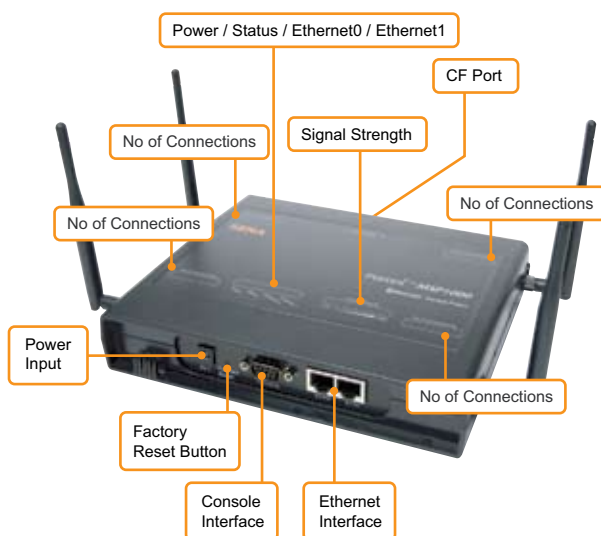
Parani-MSP1000 supports such profiles as Serial Port, LAN access, PAN and FTP for various applications. For ideal serial cable replacement applications, we provide free COM/TTY port redirector software for Windows/Linux.

Parani-MSP1000 is based on embedded Linux system and it supports strong security mechanisms such as SSL, TLS, SSH and IP filtering functions. Users also can customize the features of the box easily by using Python script.

Typical application areas of the Parani-MSP1000 include :
- Truck/Bus monitoring system
- Car Diagnostics
- Wireless POS system
- Wireless Factory monitoring PLC programming
- Wireless machine(healthcare/industrial) monitoring
- Wireless Printing
- Wireless logistics

Panel Layout

Power / Status / Ethernet0 / Ethernet1

CF Port

No of Connections

Signal Strength

No of Connections

No of Connections

Power Input

No of Connections

Factory Reset Button

Console Interface

Ethernet Interface

SENA
www.sena.com

Specifications

Ethernet Interface
- Dual 10/100 Base-T Ethernet with RJ45 connector
- Supports Static IP and Dynamic IP address

Bluetooth Interface
- Bluetooth v2.0 + EDR
- Class 1
- Profiles : Serial Port, LAN Access, PAN, Dial up Networking,
  File Transfer
- Data rate : up to 3Mbps
- Working distance

Parani-MSP1000		Parani-SD100
		Parani-ESD110

DAT-G01R Antenna	-	SAT-G01R Antenna	up to 150m
DAT-G01R Antenna	-	DAT-G01R Antenna	up to 200m
DAT-G01R Antenna	-	DAT5-G01R Antenna	up to 300m
DAT-G01R Antenna	-	PAT-G01R Antenna	up to 500m
DAT5-G01R Antenna	-	DAT5-G01R Antenna	up to 400m
DAT5-G01R Antenna	-	PAT-G01R Antenna	up to 600m
PAT-G01R Antenna	-	PAT-G01R Antenna	up to 1000m

Max. Tx power: +17dBi(Using DAT-G01R Antenna)

Receive Sensitivity: -88dBm

Point to multi point connectivity
- Up to 28 connections

Network Protocols
- IPv4, ICMP, ARP, TCP, HTTP, telnet, TFTP
- SSH, HTTPS, SSL/TLS, DNS
- SCP/SFTP/FTP, syslog, NTP
- SMTP, Dynamic DNS

Security
- IP Filtering, SSH v2, SSL/TLS, HTTPS, SCP, SFTP

CF Port
- Flash memory

Logging
- Syslog server, CF memory

Real Time Clock: Built-in support

Customization
- Python Script engine, ELDK v4.0, 2MB internal user space

Management
- Windows Utility
- Web, Telnet, Serial Console

Firmware Upgrade
- Telnet/SSH, Web, Bootp, CF memory, Zmodem, TFTP

Diagnostic LED
- POWER, STATUS, Ethernet0, Ethernet1
- Signal Strength, No of Connections

Power
- 5VDC
- Nominal Current Consumption : 1.2A@ 5VDC approximately

Environmental
- Operating temperature : 0˚C to 50˚C
- Storage temperature : -30˚C to 85˚C
- Humidity : 90% Non-condensing

Physical properties
- Dimension(L x W x H) :
  203 x 170 x 44(mm)
  7.99 x 6.69 x 1.73(in.)
- Weight :
  MSP1000A : 1414g
  MSP1000B : 1432g
  MSP1000C : 1468g

MTBF: 30.52 Years

Certification
- FCC, CE, TELEC

Warranty
- 3-year limited warranty

Ordering Information

MSP1000A Parani-MSP1000A Industrial Bluetooth Access Point with 7 connections support
MSP1000B Parani-MSP1000B Industrial Bluetooth Access Point with 14 connections support
MSP1000C Parani-MSP1000C Industrial Bluetooth Access Point with 28 connections support

Includes
- DC Power Adapter
- DAT-G01R : 3 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread
- Serial data cable
- Ethernet straight cable
- Wall mount bracket
- Quick Start Guide
- CD-ROM

Optional Accessories
- DAT5-G01R : 5 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread
- PAT-G01R : 9dBi Patch Antenna with RP-SMA Plug Right hand Thread Default Cable.
  (SMA Jack Right hand Thread w/o Default Cable)
- SEC-G01R : 15cm Extension Cable(For SAT-G01R / DAT-G01R / DAT5-G01R)
- RFC-G01R : 1m Extension Cable(For PAT-G01R)

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For more information, please visit us at http://www.sena.com

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Bluetooth USB adapter,

Parani™ UD100

The Parani-UD100 is a class 1 type Bluetooth USB adapter that supports 300 meters of wireless transmission distance by default. The working distance can be further extended up to 1000 meters using optional replacement antenna. Thanks to its longer communication distance than other regular Bluetooth USB adapters, it is suitable for industrial or special applications. Parai-UD100 is compatible with other SENA Bluetooth devices perfectly.

Features

- Bluetooth 2.0+EDR Class 1
- Working distance 300m, up to 1000m using optional antenna
- USB 2.0 interface
- Bluetooth driver CD (Toshiba driver)

Specifications

Standards
- Bluetooth 2.0+EDR Class 1
- USB 2.0

Max Transfer Rate : 3 Mbps (EDR)

Frequency Range : 2.402 ~ 2.480GHz

Transmit Output Power : +19dBm (+6dBm EDR) E.I.R.P

Receive Sensitivity
- Basic 1Mbps : -88 dBm
- EDR 2Mbps : -87dBm
- EDR 3Mbps : -82dBm

Antenna Connector : RP-SMA

Antenna Gain
- Default Stub Antenna : 1 dBi
- Optional Dipole Antennas : 3 dBi & 5 dBi
- Optional Patch Antenna : 9 dBi

Working Distance(In Open Field)
- Stub antenna – Stub antenna: 300 m
- Dipole (3 dBi) – Dipole (3 dBi) : 400 m
- Dipole (5 dBi) – Dipole (5 dBi): 600 m
- Patch antenna – Patch antenna: 1 km
* *working distance can vary depending on install environment*

Bluetooth stack software : Toshiba

Bluetooth Profiles : DUN, FAX, LAP, SPP, HID, HCRP, FTP, OPP, A2DP, AVRCP, GAVDP, HSP, HFP,PAN, BIP

Computer OS Support
- Windows 2000/XP/Vista (32/64bit)
- Linux (3rd party driver required)
- MAC OS X (MAC OS X driver required)

Size : 72(L) x 22(W) x 10(H) mm
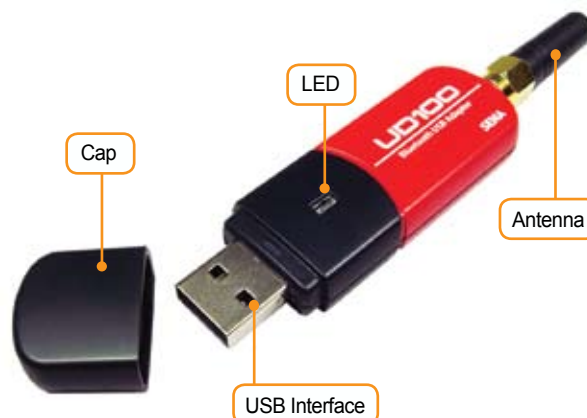
Operating Temperature : -20 ~ +70˚C

Storage Temperature : -40 ~ +85˚C

Humidity : 90% Non-condensing

Regulatory Approvals : FCC, CE, TELEC, KCC, Bluetooth SIG

Warranty : 1 year limited warranty

Exterior

LED

Cap

Antenna

USB Interface

Ordering Information

UD100-G01 Includes
- Parani-UD100
- Stub antenna
- Quick Start Guide
- CD-ROM including Windows Bluetooth driver, User Guide and Data sheet

Optional Accessories
- SAT-G01R : 1 dBi Stub Antenna - RP-SMA Plug Right-hand Thread
- DAT-G01R : 3 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread
- DAT5-G01R : 5 dBi Dipole Antenna - RP-SMA Plug Right-hand Thread
- PAT-G01R : 9dBi Patch Antenna with RP-SMA Plug Right hand Thread Default Cable.
       (SMA Jack Right hand Thread w/o Default Cable)
- SEC-G01R : 15cm Extension Cable
       (For SAT-G01R / DAT-G01R / DAT5-G01R)
- RFC-G01R : 1m Extension Cable (For PAT-G01R)

For more information, please visit us at http://www.sena.com

U.S. / Canada / South America
Tel : +1 (408) 573-7425   Fax: +1 (408) 907-3738
Toll Free (US/Canada): 1-8668-US-SENA (1-866-887-7362)

EU / Africa
Tel : +33 (0) 1 53 53 16 29   Fax: +33 (0) 1 70 24 70 90

Asia / Pacific
Tel : +82-2-571-8283   Fax: +82-2-573-7710

Contact us via E-mail
General Information : info@sena.com
Sales & Distribution : sales@sena.com
Technical Support : support@sena.com

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www.sena.com